

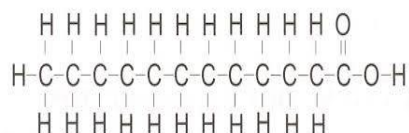
Revisiting the Macromolecules Image Assignment - KEY

Mrs. Krouse, AP Biology

Directions: We are going to do a modified version of the image assignment you completed on the computers in the library. For this assignment, you will be given several images of molecules. Next to each image, you will write the following information...

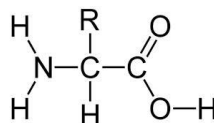
- A. The specific name of the molecule (You have the following names to choose from... a monosaccharide (in ring form), a monosaccharide (in straight chain form), a disaccharide, a polysaccharide, a glycerol, a fatty acid chain, a phospholipid, a triglyceride (aka fat), an amino acid, a polypeptide, a nucleotide, DNA, RNA)
- B. Whether the image shows a monomer or polymer (Note: there is one molecule that is actually a dimer)
- C. The type of macromolecule that is shown (i.e. a carbohydrate, lipid, protein, or nucleic acid)
- D. An explanation of how you know which type of macromolecule is shown

Example:



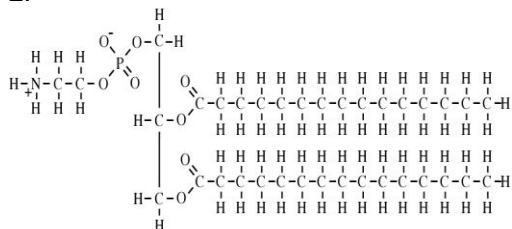
- A. Fatty acid chain
- B. Monomer
- C. Lipid
- D. A fatty acid chain is a component of most lipid molecules that contains a long chain of carbon atoms with hydrogen atoms branching off

1.



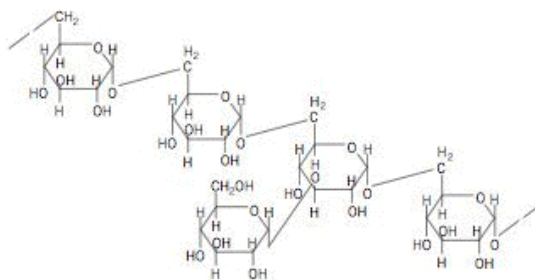
- A. Amino acid
- B. Monomer
- C. Protein
- D. An amino acid has a central carbon atom surrounded by four things: a hydrogen atom, an amino group, a carboxyl group, and an R group (contains different atoms for each amino acid)

2.



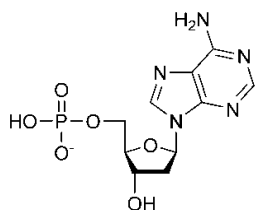
- A. Phospholipid
- B. Polymer
- C. Lipid
- D. A phospholipid has (from left to right in the image) a choline, phosphate group, glycerol, and two fatty acid chains. The choline, phosphate group, and glycerol make up the polar head region of the phospholipid, and the fatty acid chains make up the nonpolar tail region of the phospholipid.

3.



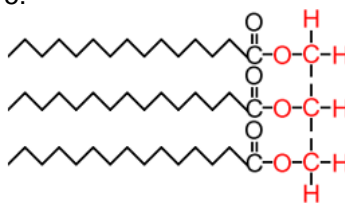
- A. Polysaccharide
- B. Polymer
- C. Carbohydrate
- D. A polysaccharide is made of monosaccharides (look like hexagons or pentagons with hydroxyl groups branching off) connected in a chain

4.



- A. Nucleotide

5.

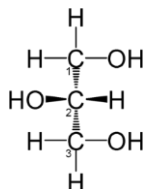


- A. Triglyceride (fat)

- B. Monomer
- C. Nucleic Acid
- D. A nucleotide is made up of a phosphate group (contains the atom phosphorus and may be represented by a circle on a diagram), a 5-carbon (aka pentose) sugar (looks like a pentagon), and a nitrogenous base (looks like one ring or two fused rings that contain nitrogen atoms)

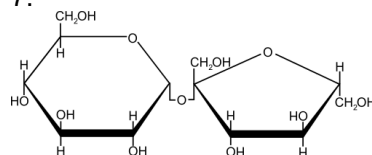
- B. Polymer
- C. Lipid
- D. A triglyceride is made of three fatty acid chains bonded to a glycerol. The fatty acid chains are shown as jagged lines. Each bend in the line represents a carbon atom. We have to assume that hydrogen atoms are branching off of the carbon chain. The glycerol contains three carbon and oxygen atoms.

6.



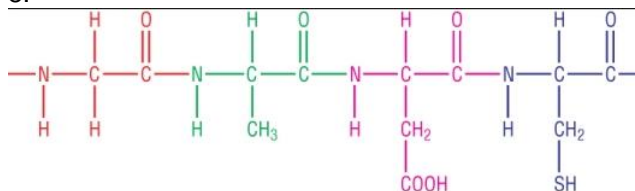
- A. Glycerol
- B. Monomer
- C. Lipid
- D. A glycerol contains three carbon atoms and oxygen atoms.

7.



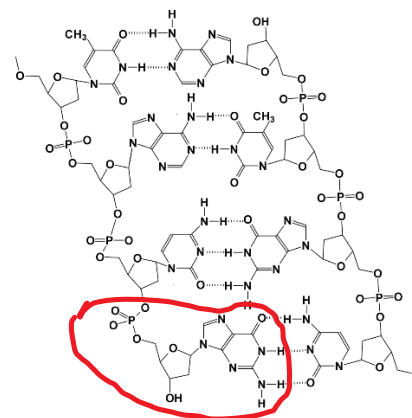
- A. Disaccharide
- B. Dimer
- C. Carbohydrate
- D. A disaccharide is made of two monosaccharides (look like hexagons or pentagons with hydroxyl groups branching off) that are bonded together

8.



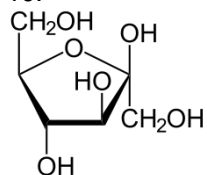
- A. Polypeptide
- B. Polymer
- C. Protein
- D. This is a polypeptide because it is a chain of amino acids. There are four amino acids in this polypeptide. The amino acids are recognizable because they have carbonyl groups (which used to be carboxyl groups but lost their -OH during dehydration synthesis to join the amino acids) and -NH's (which used to be amino groups but lost their second H during dehydration synthesis to join the amino acids).

9.



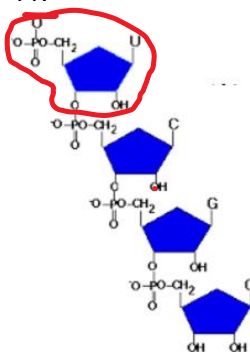
- A. DNA
- B. Polymer
- C. Nucleic Acid
- D. This is a DNA molecule because it consists of two chains of nucleotides connected at the middle to create a ladder-like structure. (In real life, the ladder is actually twisted to create a double helix or spiral staircase structure.) A single nucleotide from the DNA molecule is circled in the image. It is recognizable because it contains a phosphate group, 5-carbon sugar, and nitrogenous base (aka nitrogen base). See #4 for more information on how to recognize the components of a nucleotide.

10.



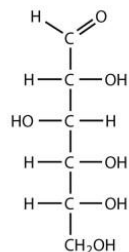
- A. Monosaccharide (in ring form)
- B. Monomer
- C. Carbohydrate
- D. This is a monosaccharide in ring form because monosaccharides in ring form typically look like hexagons or pentagons with hydroxyl groups branching off.

11.



- A. RNA
- B. Polymer
- C. Nucleic Acid
- E. This is RNA because consists of a single chain of nucleotides. A single nucleotide from the RNA molecule is circled in the image. It is recognizable because it contains a phosphate group, 5-carbon sugar and nitrogenous base. See #4 for more information on how to recognize the components of a nucleotide. In this image, the actual structure of each nitrogenous base is not shown. Instead, there is a letter provided to indicate the identity of the specific nitrogen base. There are four nitrogen bases in RNA: Adenine (A), Guanine (G), Uracil (U), and Cytosine (C).

12.



- A. Monosaccharide (in straight chain form)
- B. Monomer
- C. Carbohydrate
- D. This is a monosaccharide in straight chain form because it has 5-6 carbon atoms bonded to each other in a chain with hydroxyl groups branching off